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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/615,089

07/08/2003

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H10230/CFR

8689

1333 7590 10/01/2009
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EXAMINER

NOTE, JANIS L

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

10/01/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/615,089	Applicant(s) JIN ET AL.	
	Examiner Janis L. Dote	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-39 and 54-86 is/are pending in the application.
- 4a) Of the above claim(s) 26 and 63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-25, 27-39, 54-62, 64-80 and 83-86 is/are rejected.
- 7) ☒ Claim(s) 81 and 82 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

1. The examiner acknowledges the amendments to claims 16, 54, 81, and 82 and the cancellation of claims 1-13, 15, 40-51 and 53 filed on Jun. 3, 2009. Claims 16-39 and 54-86 are pending.

2. Applicants' election without traverse of the species identified in the reply filed on Oct. 24, 2005, was acknowledged in the office action mailed on Jan. 12, 2006, paragraph 2.

Claims 26 and 63 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species of invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on Oct. 24, 2005.

3. Claims 81 and 82 are objected to because of the following informalities:

In claims 81 and 82, the phrase "[a]n electrophotographic comprising . . ." is missing the noun, i.e., element.

In rewriting the claims as independent claims in the amendment filed on Jun. 3, 2009, it appears that applicants inadvertently deleted the noun "element" from the phrase "[t]he electrophotographic element of Claim 80 . . ."

Appropriate correction is required.

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4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 16-19, 22-25, 27-39, 54-56, 59-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as unpatentable over US 6,495,300 B1 (Qi), as evidenced by (1) applicants' admissions at page 24, lines 17-23, page 40, lines 8-14, and in example 12 at pages 40-41, of the originally filed specification (Applicants' admission I), (2) US 4,647,521 (Oguchi), (3) US 3,923,485 (Franz), (4) US 5,930,090 (Beaurline), and (5) US 4,082,710 (Vrancken); combined with US 5,427,880 (Tamura), as evidenced by Diamond, Handbook of Imaging Materials, p. 426, and Fig. 9.22 at page 430 (Diamond) and US 6,376,695 B1 (Kushibiki).

Qi discloses an electrophotographic photoconductive imaging element comprising an electrically conductive layer, a barrier layer, a photogenerating layer (also known in the electrophotographic arts as a charge generating layer), a charge transporting layer, and an overcoat layer comprising a crosslinked composite polysiloxane-silica. The crosslinked composite polysiloxane-silica is obtained by reacting 0.56 g of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a), 0.24 g of the organosilane compound 3-aminopropyltrimethoxy-

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silane, and 0.016 g of hydrophilic silica particles sold under the tradename AEROSIL 200 obtained from Degussa in a mixture of ethanol/water. The overcoat layer has a layer thickness of about 5 microns. See col. 16, lines 62-67, and example VI at cols. 22-23. The polymer of formula (IV-a) comprises 0.02 mole fraction of the monomer 3-(trimethoxysilyl)propylmethacrylate and 0.10 mole fraction of a vinyl-containing monomer comprising a hole transporting moiety, e.g., vinylcarbazole. See col. 5, lines 17-18, formula (IV-a) at col. 12, and example 1 at cols. 19-20.

According to Qi, the electrophotographic imaging member comprising an overcoat layer comprising the crosslinked composite polysiloxane-silica provides satisfactory imaging performance and has excellent mechanical wear resistance characteristics. Col. 4, lines 40-43 and 55-59. The overcoat layer has excellent adhesion to the charge transport layer. Col. 4, lines 60-64.

Qi does not identify its crosslinked composite as a silsesquioxane as recited in the instant claims. However, the instant specification at page 40, lines 8-14, provides a structure of a silsesquioxane. The Qi crosslinked composite has the structure shown in Formula (V) at col. 9, which is similar to that shown at page 40 of the instant specification.

Accordingly, it is reasonable to conclude that the Qi crosslinked composite is a silsesquioxane as recited in the instant claims. The burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

Qi does not identify its overcoat layer as a charge transport layer as recited in instant claim 54. However, as discussed above, the Qi crosslinked composite is obtained from the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a), that comprises vinyl-containing monomer units comprising a "hole transporting moiety," e.g., vinylcarbazole. Thus, it is reasonable to conclude that the Qi overcoat layer has charge transporting properties. The burden is on applicants to prove otherwise. Fitzgerald, supra. Accordingly, the placement of the respective layers, i.e., barrier layer, photogenerating layer, charge transporting layer, and overcoat layer, in the Qi photoconductive imaging member meets the layer arrangement limitations recited in instant claims 54, 75, 80, and 83.

The Qi overcoat layer thickness of "about 5 microns" is within the layer thickness ranges recited in instant claims 84 and 86. The Qi overcoat layer thickness of "about 5 microns" is also within the layer thickness range of "about 1 micron to about 3 microns" (emphasis added) recited in instant claim 85. The term "about" admits variation. There is no disclosure in

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the instant specification of critical properties that exclude the Qi overcoat layer thickness of about 5 microns from the upper limit of "about 3 microns" of the layer thickness range recited in instant claim 85. Thus, the Qi layer thickness of about 5 microns is within the layer thickness range recited in instant claim 85.

As discussed above, the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) comprises 0.02 mole fraction of the monomer 3-(trimethoxysilyl)propylmethacrylate and 0.10 mole fraction of the hole-transporting moiety-containing monomer. That silyl-containing monomer is applicants' elected species, methacryloxypropyltrimethoxysilane (MATMS), and therefore also meets the compositional limitations of the silyl-containing monomer recited in instant claims 16, 17, 22, 27-29, 54, 55, 59, and 64-66. The 0.02 mole fraction of Qi's MATMS is within the silyl-containing monomer mole fraction "b" range of "about 0.99 to about 0.01" recited in instant claims 16 and 54. The 0.10 mole fraction of the Qi vinyl-containing monomer comprising a hole transporting moiety is numerically within the charge transport moiety-containing monomer mole fraction "a" ranges of "about 0.01 to about 0.99" recited in instant claims 16 and 15, and of "about 0.01 to about 0.9" recited in instant claims 23 and 60. The sum of the

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Qi mole fractions 0.02 and 0.10 is 0.12, which is within the mole fraction sum (a + b) range of 1.00 or less recited in instant claims 16 and 54. Qi further teaches that the vinyl-containing monomer comprising a hole transporting moiety may be present in mole fractions of from about 0 to about 0.5.

Col. 15, line 39. The upper limit, about 0.5 mole fraction, of the mole fraction of the Qi vinyl-containing monomer comprising a transporting moiety is within the mole fraction (a) ranges recited in instant claims 24, 25, 61, and 62. When the mole fraction of the vinyl-containing monomer comprising a hole-transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) in example 1 is adjusted to be about 0.5 mole fraction, the sum of the mole fractions 0.02 and about 0.5 would be about 0.52, which is within the sum of the mole fractions range recited in instant claims 16 and 54.

The organosilane compound 3-aminopropyltrimethoxysilane meets the optional silane monomer limitations recited in instant claims 16, 30-33, 54, and 67-71. Qi teaches that the organosilane compound can equally be methyltrimethoxysilane, which meets the optional silane monomer limitations recited in instant claims 34, 35, 72, and 73. Col. 11, line 56. The organosilane compound methyltrimethoxysilane also meets applicants' elected species.

Based on the information provided in example VI of Qi, the amount of silica particles in the reaction product is determined to be 2 wt% based on the weight of the crosslinked composite polysiloxane-silica. The amount of 2 wt% is within the amount range of "about 5 to 30 weight percent" based on the weight of the silsesquioxane recited in instant claims 16 and 54. The term "about" admits variation. There is no disclosure in the instant specification of critical properties that exclude the Qi amount of 2 wt% from the lower limit, "about 5 weight percent" recited in instant claims 16 and 54. Thus, the Qi silica particles amount of 2 wt% is within the amount range recited in instant claims 16 and 54.

Qi does not identify the silica particles sold under the tradename AEROSIL 200 obtained from Degussa as "colloidal silica" as recited in instant claims 16 and 54. However, according to Oguchi, which is drawn to electrophotographic photosensitive members, at col. 8, lines 65-68, "[h]itherto used colloidal silica involve[s] aqueous sols using water as a dispersion medium and aerosols using air as a dispersion medium." Silica particles sold under the tradename AEROSIL 200 are well known as "colloidal silica." See Vrancken, col. 22, line 33, which identifies the material sold under the tradename AEROSIL 200 from Degussa as "colloidal silica"; and Beaurline,

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col. 3, lines 13-23, which also identifies the material sold under the tradename AEROSIL 200 obtained from Degussa as "colloidal silica," and states that it is used as a gelling agent. Franz also discloses that silica particles, such as the commercially available AEROSIL 200 from Degussa, that are produced by high temperature hydrolysis, and referred to as fumed or pyrogenic silica, are "colloidal in nature." Col. 3, line 51, to col. 4, line 12. The originally filed specification at page 24, lines 17-20, discloses that the "hydrolysis and condensation of silanes can be catalyzed by adding colloidal silica, i.e., silica particles that are stabilized by either an acidic or basic surface charge, and can influence the mechanical properties of the resulting silsesquioxane coating." According to Qi, in the crosslinking process, the silyl groups of the organosilane and the polymer (IVa) undergo hydrolysis to obtain hydroxysilyl groups. The hydroxysilyl groups condense with the hydroxysilyl groups on the silica particle surface to form siloxane (Si-O-Si) bonds. See col. 15, lines 53-62, and col. 16, lines 13-55. Qi further teaches at col. 15, lines 62-68, that "the incorporation of the silica particles into the overcoating layer can provide improved imaging member mechanical property, and the presence of silica particles also can enhance the crosslinking reaction during the fabrication of

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the overcoating layer." These properties appear to be the same properties achieved by using the colloidal silica recited in instant claims 16 and 54. Accordingly, it is reasonable to conclude that the Qi silica particles sold under the tradename AEROSIL 200 from Degussa are "colloidal" silica particles as recited in instant claims 16 and 54. The burden is on applicants to prove otherwise. Fitzgerald, supra.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a vinyl-containing monomer comprising a tertiary arylamine charge transport moiety as recited in instant claims 16 and 54, nor from the monomer di-p-anisylamino styrene (DAAS), applicants' elected species. However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68.

Tamura discloses the monomer di-p-anisylamino styrene, which is representative of the Tamura formula (III). See Tamura, col. 3, lines 20-45, and col. 28, compound no. 124. Di-p-anisylamino styrene meets applicants' elected species. The monomer di-p-anisylamino styrene also meets the tertiary arylamine charge transport-containing monomer limitations recited in instant claims 16, 19, 28, 54, 65, and 74. See the chemical formula CTM I in claims 19 and 74. Tamura does not identify the di-p-anisylamino styrene as a vinyl-containing

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monomer comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (III) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the di-p-anisylamino-phenyl moiety of the monomer has an oxidation potential as recited in instant claims 18 and 56. However, as discussed above, the di-p-anisylamino phenyl moiety meets the compositional limitations recited in instant claims 19 and 74. Kushibiki discloses that di-p-anisylamino benzene has an oxidation potential of 0.72 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claims 18 and 56. Kushibiki, col. 21, lines 15-20. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claims 18 and 56. However, because the di-p-anisylamino phenyl moiety meets the tertiary arylamine compositional limitations recited in claims 19 and 74 and because it has an oxidation potential value

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that is within the numerical value of the potential range recited in instant claims 18 and 56, it is reasonable to presume that the di-p-anisylamino phenyl moiety in the Tamara di-p-anisylamino styrene monomer has an oxidation potential as recited in instant claims 18 and 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura di-p-anisylamino styrene as the vinyl-containing monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer in the photoconductive imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully obtaining a crosslinked composite polysiloxane-silica that has excellent adhesion to a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic photoconductive imaging member having the benefits disclosed by Qi and Tamura.

Instant independent claims 16 and 54 are written in product-by-process format. Instant claims 16 and 54 recite that the silsesquioxane comprises the condensed reaction product of

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the charge transport polymer recited in those claims and about 5 to 30 weight percent of "basic surface charge colloidal silica based on the weight of the silsesquioxane, wherein the basic surface charge colloidal silica is stabilized with a sodium salt of silanol, and the condensation is catalyzed by acetic acid, with optionally at least one additional silane monomer having at least one hydrolyzable group thereon." Qi does not disclose that its silica particles sold under the tradename AEROSIL 200 have a basic surface charge as recited in instant claims 16 and 54. Qi also does not teach that the crosslinking reaction uses acetic acid as recited in instant claims 16 and 54.

However, Qi teaches making the crosslinked composite polysiloxane-silica by the condensation method discussed supra in a mixture of ethanol/water. For the reasons discussed above, the silica particles sold under the trademark AEROSIL 200 are colloidal. The mixture of ethanol/water meets the solvent medium used in the condensation reaction recited in instant in instant claims 36-39 and 76-79. As discussed above, the combined teachings of Qi and Tamura render obvious a silyl and hole transporting moiety-containing polymer and a resultant crosslinked composite polysiloxane-silica that are within the compositional limitations of the charge transport polymer and

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the silsesquioxane, respectively, recited in the instant claims. As further discussed above, Qi teaches that in the crosslinking process, the silyl groups of the organosilane and the polymer (IVa) undergo hydrolysis to obtain hydroxysilyl groups. The hydroxysilyl groups condense with the hydroxysilyl groups on the silica particle surface to form siloxane (Si-O-Si) bonds. The originally filed specification at page 24, lines 17-20, discloses that "hydrolysis and condensation of silanes can be catalyzed by adding colloidal silica, i.e., silica particles that are stabilized by either an acidic or basic surface charge, and can influence the mechanical properties of the resulting silsesquioxane coating." Furthermore, in example 12 of the originally filed specification, the specification describes the silsesquioxane used in that example, which was obtained by adding an aqueous solution of colloidal silica sold under the trademark LUDOX LS, as a sol gel "catalyzed by acetic acid" as recited in instant claims 16 and 54. The LUDOX LS colloidal silica is described at page 24, lines 22-23, of the specification, as a "colloidal silica stabilized with a small amount of sodium salt of silanol." In example 12, the originally filed specification at page 41, lines 6-13, describes adding to the reaction mixture an "aqueous dispersion of Ludox LS colloidal silica . . . previously acidified to pH 4

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with glacial acetic acid." Thus, it appears that the basic charge groups on the colloidal silica stabilized by a sodium salt of silanol are not present on the surface of the colloidal silica in the resultant silsesquioxane. As discussed above, according to Qi, "the incorporation of the silica particles into the overcoating layer can provide improved imaging member mechanical property, and the presence of silica particles also can enhance the crosslinking reaction during the fabrication of the overcoating layer." Qi teaches that a photoconductive imaging element comprising such an overcoat layer that comprises the crosslinked composite polysiloxane-silica has excellent mechanical wear resistance. These properties appear to be the same properties disclosed to be achieved by the use of the basic surface charge colloidal silica recited in instant claims 16 and 54. Thus, it appears that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of the prior art is the same or substantially the same as the silsesquioxane made by the process limitations recited in the instant claims. The burden is on applicants to prove otherwise. In re Marosi, 218 USPQ 289 (Fed. Cir. 1983) and In re Thorpe, 227 USPQ 964 (Fed. Cir. 1985). MPEP 2113.

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6. Claims 16-25, 27-39, 54-62, 64-80, and 83-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qi, as evidenced by (1) Applicants' admission I, (2) Oguchi, (3) Franz, (4) Beaurline, and (5) Vrancken; combined with Tamura, as evidenced by Diamond and Kushibiki.

Qi, as evidenced by Applicants' admission I, Oguchi, Franz, Beaurline, and Vrancken, discloses an electrophotographic photoconductive imaging member as described in paragraph 5 above, which is incorporated herein by reference. The crosslinked composite polysiloxane-silica is generated from the reaction of the silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) with an organosilane in a mixture of ethanol/water and silica particles. The polymer of formula (IV-a) is obtained by reacting 3-(trimethoxysilyl)-propylmethacrylate and a vinyl-containing monomer comprising a hole transporting moiety, e.g., vinylcarbazole.

Qi does not exemplify a silyl-functionalized hydroxyalkyl polymer obtained from a vinyl-containing monomer comprising a tertiary arylamine charge transport moiety as recited in instant claims 16 and 54.

However, Qi does not limit the type of vinyl-containing monomer comprising a hole transporting moiety. See col. 6, lines 6, 31, and 55-68. Qi teaches that the vinyl-containing

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monomer can be a monomer comprising an ester group. Col. 6, line 60.

Tamura discloses (meth)acrylate monomers comprising a triphenylamino moiety, which meet the triarylamine monomer limitations recited in instant claims 16, 19-21, 28, 54, 57, 58, 65, and 74. See Tamura, formula (II) at col. 3, lines 15 and 24-39, and, for example, compound nos. 114 and 116. See formula CTM-1 in claims 19 and 74. Tamura does not identify said (meth)acrylate monomers as monomers comprising a hole transporting moiety. However, it is well known in the art of electrophotography that triarylamines are hole transporting compounds. See Diamond, page 428, lines 26-29, and Fig. 9.22 at page 430. According to Tamura, polymerizable carbon-carbon double-bond-containing monomers of the formula (II) have a triphenylamine skeleton, which is "regarded as a hopping site of a charge carrier, so that they have excellent charge carrier transporting characteristics." Col. 3, lines 46-50.

Tamura also does not disclose that the triphenylamino moieties of the (meth)acrylate monomers have an oxidation potential as recited in instant claims 18 and 56. However, as discussed above, the triphenylamino moieties meet the compositional limitations recited in instant claims 19 and 74. Kushibiki discloses that the triphenylamino moiety in Tamura

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compound nos. 114 and 116 has an oxidation potential of 0.72 volts, which is within the range of about 0.6 to about 1.2 volts recited in instant claims 18 and 56. Kushibiki, col. 21, lines 15-20. Kushibiki does not disclose that the oxidation potential is "versus a standard calomel electrode" as recited in instant claims 18 and 56. However, because the triphenylamino moiety in Tamura compound nos. 114 and 116 meets the tertiary arylamine compositional limitations recited in claims 19 and 74 and because it has an oxidation potential value that is within the potential range recited in instant claims 18 and 56, it is reasonable to presume that the triphenylamino moiety in the Tamara compounds nos. 114 and 116 has an oxidation potential as recited in instant claims 18 and 56. The burden is on applicants to prove otherwise. Fitzgerald, supra.

It would have been obvious for a person having ordinary skill in the art, in view of the teachings of Qi and Tamura, to replace the vinylcarbazole monomer with the Tamura (meth)acrylate monomer comprising a triphenylamine moiety as the vinyl-containing monomer comprising a hole transporting moiety in the Qi silyl-functionalized hydroxyalkyl polymer of Formula (IV-a) and to use the resultant polymer to form the overcoat layer of the imaging member disclosed by Qi. That person would have had a reasonable expectation of successfully

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obtaining a crosslinked composite polysiloxane-silica that has excellent adhesion to a charge transport layer as disclosed by Qi and improved charge transporting characteristics as disclosed by Tamura; and an electrophotographic imaging member having the benefits disclosed by Qi and Tamura.

Instant independent claims 16 and 54 are written in product-by-process format as described in paragraph 5 above. Qi does not teach that its silica particles sold under the tradename AEROSIL 200 have a basic surface charge as recited in instant claims 16 and 54. Qi also does not teach that the crosslinking reaction uses acetic acid as recited in instant claims 16 and 54. However, for the reasons discussed in paragraph 5 above, the silica particles sold under the trademark AEROSIL 200 are colloidal. As discussed above, the combined teachings of Qi and Tamura render obvious a silyl and hole transporting moiety-containing polymer and a resultant crosslinked composite polysiloxane-silica that are within the compositional limitations of the charge transport polymer and the silsesquioxane, respectively, recited in the instant claims. For the reasons discussed in paragraph 5 above, which are incorporated herein by reference, it appears that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of the prior art is the same or

substantially the same as the silsesquioxane made by the process limitations recited in the instant claims. The burden is on applicants to prove otherwise. Marosi, supra, and Thorpe, supra. MPEP 2113.

7. Applicants' arguments filed on Jun. 3, 2009, as applicable to the rejections over Qi in paragraphs 5 and 6 above have been fully considered but they are not persuasive.

Applicants assert that the crosslinked product rendered obvious over the combined teachings of Qi and Tamura differs from the condensation product recited in the instant claims. Applicants assert that the "chemistry for colloidal silica aqueous sols employed in the present invention are distinct from that of use of fumed silicas as employed by Qi." Applicants assert that Qi requires milling to disperse the silica and the use of aminopropyltrimethoxysilane as the base to catalyze the so-gel reaction; while "the use of basic surface charge colloidal silica stabilized with a sodium salt of silanol . . . requires no milling for dispersion." Applicants assert that the non-volatile base Na₂O present on the surface of the colloidal silica from the sodium salt of silanol enables easier incorporation of relatively higher levels of silica particles, i.e., 5-30 wt percent as opposed to the 2 wt percent calculated

by the examiner for the Qi example, and "is believed to facilitate greater degree of condensation of the silsesquioxane, as the fumed silica itself does not carry with it the basic charge carriers in the form of sodium salt of silanol."

Applicants' assertions are not persuasive. As noted in paragraphs 5 and 6 above, the silsesquioxane recited in the instant claims is written in product-by-process format. Applicants have not provided any credible evidence showing that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of Qi and Tamura differs from the silsesquioxane obtained by the process steps recited in the instant claims.

Furthermore, as discussed in paragraphs 5 and 6, the combined teachings of Qi and Tamura render obvious a silyl and hole transporting moiety-containing polymer and a resultant crosslinked composite polysiloxane-silica that are within the compositional limitations of the charge transport polymer and the silsesquioxane, respectively, recited in the instant claims. Instant claims 16 and 54 do not exclude the optional silane monomer from being 3-aminopropyl-trimethoxysilane. In addition, as discussed in paragraphs 5 and 6, the examiner's calculated Qi silica amount of 2 wt% is within the colloidal silica amount range of "about 5 to 30 weight percent" (emphasis added) recited

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in instant claims 16 and 54. (The examiner notes that contrary to applicants' remarks regarding the amendments to claims 16 and 54 filed on Jun. 3, 2009, those amendments did not change the previously filed colloidal silica amount range of "about 5 to 30 weight percent" to "5 to 30 weight percent.")

In addition, as discussed in paragraphs 5 and 6 above, Qi teaches that the crosslinked composite polysiloxane-silica is obtained by condensing the hydroxysilyl groups (silanol groups) on the surface of the silica particles with the hydroxysilyl groups in the polymer (IVa) and organosilane compound. Qi teaches that "the incorporation of the silica particles into the overcoating layer can provide improved imaging member mechanical property, and the presence of silica particles also can enhance the crosslinking reaction during the fabrication of the overcoating layer." As noted in paragraphs 5 and 6, these properties appear to be the same properties disclosed to be achieved by the use of the basic surface charge colloidal silica recited in instant claims 16 and 54. See the originally filed specification at page 24, lines 17-20, which discloses that the "hydrolysis and condensation of silanes can be catalyzed by adding colloidal silica, i.e., silica particles that are stabilized by either an acidic or basic surface charge, and can

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influence the mechanical properties of the resulting silsesquioxane coating."

Moreover, instant claims 16 and 54 do not recite that the condensation reaction is catalyzed by the basic charge carriers on the surface of colloidal silica. Rather, instant claims 16 and 54 recite that "the condensation reaction is catalyzed by acetic acid." In addition, there appears to be no disclosure in the originally filed specification that supports applicants' assertion that siloxane condensation reactions catalyzed by the basic charge carriers, i.e., Na_2O , in the form of sodium salt of silanol on the surface of the basic colloidal silica stabilized by a sodium silanol results in a "greater degree of condensation of the silsesquioxane." The disclosure at page 24, lines 17-20, states that the hydrolysis and condensation of silanes can be catalyzed by either acidic or basic surface charged silica particles. In instant examples 12-52, the originally filed specification describes the silsesquioxanes used in those examples, which were obtained by adding an aqueous solution of colloidal silica sold under the trademark LUDOX LS, as sol gels "catalyzed by acetic acid." The LUDOX LS colloidal silica is described at page 24, lines 22-23, of the specification, as a "colloidal silica stabilized with a small amount of sodium salt of silanol." In examples 12-52, the specification at page 41,

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lines 8-10, describes adding to the reaction mixture an "aqueous dispersion of Ludox LS colloidal silica . . . previously acidified to pH 4 with glacial acetic acid." Thus, it appears that the basic charge groups, i.e., Na_2O , on the colloidal silica are not used in the acid catalyzed condensation reactions in examples 12-52. Furthermore, the hydrolysis and condensation general scheme shown at page 40 in the instant examples is the same scheme shown at page 24 of the specification that is described to represent the "hydrolysis and condensation of silane compounds (sol-gels) by acid catalysis to form silsesquioxanes" (emphasis added). See the originally filed specification, paragraph bridging pages 23 and 24. Applicants have not indicated where in the originally filed specification there is any credible evidence to support their assertion.

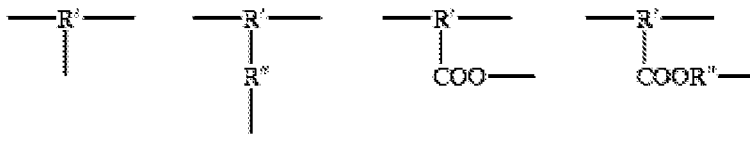
Accordingly, applicants have not met their burden to show that the crosslinked composite polysiloxane-silica rendered obvious over the combined teachings of the prior art is not the same or substantially the same as the silsesquioxane made by the process limitations recited in the instant claims.

Applicants further assert that there is no teaching or suggestion in Qi to "use any other type of hole-transporting moieties." Applicants also assert that Tamura is "directed towards the use of such charge transporting monomers to form an

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interpenetrating network of the polymerized monomers themselves in a binder resin." Applicants assert that the "in-situ photopolymerization of the vinyl functional group" taught by Tamura is "not relevant to the present invention because it could not be used to prepare abrasion resistant coating based on silsesquioxanes."

Applicants' assertions are not persuasive. As noted in the rejections in paragraphs 5 and 6 above, Qi teaches that the exemplified vinyl carbazole monomer in its silyl-functionalized hydroxalkyl polymer can be replaced with other monomers comprising a hole transporting moiety. See, for example, the rejections in paragraph 5, page 10, first full paragraph, and in paragraph 6, the paragraph bridging pages 16 and 17, which cite the teachings in Qi at col. 6, lines 6, 31, and 55-68. Qi at col. 6, lines 6 and 31, teaches that in its polymer formula, "E" is "a hole transporting moiety." Qi at col. 6, lines 55-68, teaches that "D", which is bonded to "E" and is part of the backbone of the vinyl polymer can be one of the following groups



where R' and R'' are independently trivalent linkages and divalent linkages, respectively, having, for example, from

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about 2 to about 24 carbon atoms. Thus, Qi teaches that the vinylcarbazole monomer in its exemplified polymer (IV-a) in example VI can be replaced with other vinyl-containing monomers comprising a hole transporting moiety, such as those where the hole transporting moiety is attached to the vinyl polymer backbone itself or through the linking group -R"-, -COO-, or -COOR"-. The disclosure of a reference is not limited to its examples or to its preferred embodiments. Rather, a reference is relevant for all that it teaches. In re Heck, 216 USPQ 1038, 1039 (Fed. Cir. 1983). "[I]n a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.'" Merck & Co. Inc. v. Biocraft Laboratories Inc., 10 USPQ2d 1843, 1846 (Fed. Cir. 1989) (quoting In re Lamberti, 192 USPQ 278, 280 (CCPA 1976)).

Applicants' assertions regarding Tamura are also not persuasive. As discussed in the rejections in paragraphs 5 and 6 above, Qi teaches the formation of a crosslinked composite polysiloxane-silica using a vinyl-addition silyl-functionized hydroxyalkyl polymer comprising units obtained from a vinyl-containing monomer comprising a silyl moiety and units of a vinyl-containing monomer comprising a hole-transporting moiety. Tamura is cited to show that vinyl-containing monomers

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comprising hole transporting moieties that are within the teachings of Qi and within the scope of the instant claims are well known in the art. For the reasons discussed in the rejections in paragraphs 5 and 6, in view of the teachings of Qi and Tamura, the combined teachings of Qi and Tamura render prima facie obvious the charge transport polymer recited in the instant claims.

Accordingly, the rejections in paragraphs 5 and 6 stand.

8. Claims 81 and 82 would be allowable if rewritten or amended to overcome the objections, set forth in this Office action.

The prior art of record does not teach or suggest the electrophotographic element recited in claims 81 and 82.

Qi does not teach or suggest that its charge transport layer in the electrophotographic imaging member, which is located between the charge generating layer and the overcoat layer, can comprise the crosslinked composite polysiloxane-silica or the silyl-functionalized hydroxyalkyl polymer comprising the hole-transporting moieties.

9. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS**

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ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Janis L. Dote whose telephone number is (571) 272-1382. The examiner can normally be reached Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Mark Huff, can be reached on (571) 272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry regarding papers not received regarding this communication or earlier communications should be directed to Supervisory Application Examiner Ms. Sandra Sewell, whose telephone number is (571) 272-1047.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or

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access to the automated information system, call 800-786-9199
(IN USA OR CANADA) or 571-272-1000.

/Janis L. Dote/
Primary Examiner, Art Unit 1795

JLD
Sep. 28, 2009